

Robotique en Rust

Capitole du Libre 2023

2023-11-18

Guilhem Saurel

Disponible à

[https://homepages.laas.fr/gsaurel/
robotique-rust.pdf](https://homepages.laas.fr/gsaurel/robotique-rust.pdf)

Sous license



<https://creativecommons.org/licenses/by-sa/4.0/>

Source

`https://gitlab.laas.fr/gsaurel/talks :
robotique-rust.md`

Discussions & Projet accompagnant

`https://github.com/nim65s/RobotS`



Figure 1: IR en robotique humanoïde

<https://www.youtube.com/watch?v=1-TDT7pREOg>

Rust

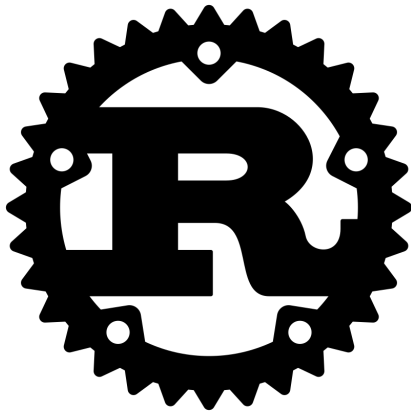


Figure 2: Rust

```
struct Pose {  
    x: f64,  
    y: f64,  
}
```

```
enum Mode {  
    Idle,  
    Move(Pose, f64),  
}
```

```
struct Robot {  
    name: String,  
    pose: Pose,  
    mode: Mode,  
}
```

```
pub trait SetSpeed {  
    fn set_speed(&mut self, tgt: f64) -> Result;  
}
```

```
pub trait SetSpeed {  
    fn set_speed(&mut self, tgt: f64) -> Result;  
}  
  
impl SetSpeed for Robot {  
    fn set_speed(&mut self, tgt: f64) -> Result {  
        match self.mode {  
            Mode::Idle => Err(Error::IsIdle),  
            Mode::Move(pose, _) => {  
                self.mode = Mode::Move(pose, tgt);  
                Ok(())  
            }  
        }  
    }  
}
```

```
#[tokio::main]
async fn main() -> Result {
    let port = 1234;
    tokio::spawn(async move {
        serve(port).await;
    });

    let mut client = Client::connect(port).await?;
    client.set("hello", "world").await?;

    let result = client.get("hello").await?;
    println!("got {result:?}");

    Ok(())
}
```

```
#[tokio::main]
async fn main() {
    let (tx, mut rx) = mpsc::channel(32);

    tokio::spawn(async move {
        tx.send("sending from first handle").await;
    });

    while let Some(message) = rx.recv().await {
        println!("GOT = {}", message);
    }
}
```

Rust Embedded

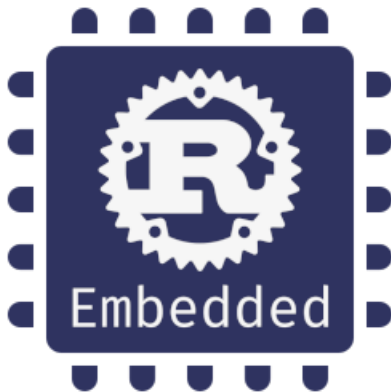


Figure 3: Rust Embedded

- PAC: Peripheral Access Crates
- HAL: Hardware Abstraction Layers

Les sont implémentés avec les traits fournis par `embedded-hal`, et fonctionnent partout !

- PAC: Peripheral Access Crates
- HAL: Hardware Abstraction Layers

Les sont implémentés avec les traits fournis par `embedded-hal`, et fonctionnent partout !

ref. https://www.youtube.com/watch?v=vLYit_HHPaY

- RTIC
- Embassy

Web

The logo for Leptos features the word "Leptos" in a sans-serif font. The letters "L", "e", "p", "t", and "s" are dark blue, while the "o" is red. The red "o" is stylized with a small circle above it and a curved line below it, resembling a smile or a drop.

Figure 4: Fast full-stack web apps in Rust

Démo !

<https://github.com/nim65s/RobotS>

Merci de votre attention !